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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,444	11/20/2001	James A. Aman		4158

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JAMES A. AMAN  
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HATFIELD, PA 19440

EXAMINER
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SENF, BEHROOZ M

ART UNIT	PAPER NUMBER
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2621

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/19/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/006,444	<b>Applicant(s)</b> AMAN ET AL.	
	<b>Examiner</b> Behrooz Senfi	<b>Art Unit</b> 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 1/23/2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 97-124 is/are pending in the application.
- 4a) Of the above claim(s) 1-96 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 97-124 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                 | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's arguments, filed 01/05/2007 have been considered but are moot in view of the new ground(s) of rejection.

Applicant canceled claims 1 – 96 and presents new claims 97 – 124.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 121 – 124 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 121, the phrase "may" in lines 17 of the claim, renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

### ***Claim Objections***

4. Claims 97 – 110 and 121 – 124 are objected to because of the following:

Newly presented claim 97, includes the limitations "and where the second stream of video images is not used to either determine any participant's or object's centroid X, Y coordinates or to otherwise update the tracking data base (last three lines in claim 97)."

Applicant cited portion and column of the specification (remarks, page 2) as a support for the above subject matter is confusing, and the cited portion/column does not match with the spec, clarification is requested.

5. Newly presented claim 121, includes the limitations "where dimensional characteristics of each detected participant and/or game object, such as its size, also be determined." Applicant is required to indicate, which portion of specification describes the above subject matter.

6. Newly presented claims 107 and 121, also includes the limitations "combining this determined information from each and every first set camera into a tracking database of at least the ongoing centroid X, Y coordinates of each one or more marked participants and/or game objects matched with their identities, as well as the ongoing centroid X, Y coordinates of one or more non-marked game objects, all relative to the entire playing area." Applicant is required to indicate, which portion of specification describes the above subject matter.

For the purpose of art rejection, the claims are rejected as best understood by the examiner.

### ***Double Patenting***

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory

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double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 121 - 124 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over combination claims 1 – 77 of U.S. Patent 6,567,116.

Although the conflicting claims are not identical in terms of wording and terminology, their scopes are substantially the same and they are not patentably distinct from each other because: Claim 121 of the instant application is; a method for automatically uniquely identifying and tracking one or more participants, including players and game officials, as well as game objects as they move about within a predefined playing area, comprising; placing at least one uniquely encoded marker adhered onto a top surface of each player/participant and/or game object to be uniquely identified and generating a first video stream of images using a first set of two or more stationary cameras and simultaneously analyzing the continuous images from each camera in order to detect the presence of any one or more participants and/or game objects within each and every camera's view to determine each detected participant's and/or game object's relative centroid X, Y location within that view, to recognize the encoded markers adhered onto a top surface of each participant thereby determining each participant's unique identity, where dimensional characteristics of each detected participant and/or game object, such as its size may also be determined during the process ..., which are similar in scope to combination claims 28 – 53, which is an automated system for following the movement of one or more objects within a

predefined area using markers and set of cameras for detect and determine each participant's unique identity.

It is noted that the difference is "retroreflects or fluoresces energy", which is a well-known features in the prior art of the record; as evidenced by (US 2003/0016368) page 2, paragraph 0002. In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to implement such teaching for ease of tracking.

It is noted that allowing claims 121 - 124 of the instant application would result in an unjustified or improper timewise extension of the "right to exclude" granted by a patent. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 97 – 99, 106, 111 – 113 and 120 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sengupta et al (US 6,359,647) in view of Jain et al (US 5,729,471) further in view of Glatt (US 6,724,421).

Regarding claims 97 and 111, Sengupta teaches, a system for automatically videoing the activities of one or more participants (figs. 1 - 2, camera handoff system 120, col. 1, lines 65 – col. 2, lines 3, which is based upon computer analysis of captured video images and not requiring user intervention), Sengupta teaches a first

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stationary camera for generating a first video stream of images of predefined area continuously through the predefined time (i.e. fig. 1, stationary "consider as non-adjustable" video camera 103), where the first video stream of images is exclusively responsible for providing the data necessary to determine the relative ongoing centroid X, Y location of each and every participant and object moving in the predefined area throughout the entire duration of tracking, regardless of the current centroid location of any one or more (fig. 1, first stream of video images are the images that are being captured by the video camera 103 and being transferred to the system 120, for analyzing those images to first determine the relative X, Y location of participants or objects), and a first algorithm operated on a computer system responsive to the first stream of video images (i.e. fig. 1, first stream of video images are the images that are being captured by the video camera 103 and being transferred to the system 120) for simultaneously analyzing the continuous images from each first camera in order to first detect the presence of any one or more participants and/or objects within each and every camera's view and then to second determine each detected participant's and/or object's relative centroid X, Y location within that view, where dimension characteristics of each detected participant and/or object, such as its size, may also be determined during the process(i.e. col. 4, lines 8 - 10, col. 5, lines 37 - 53) and third for continuously throughout the predefined time combining this determined information from the first camera into a tracking database of at least the ongoing centroid X, Y coordinates of each one or more participants and objects, relative to the entire predefined area (i.e. fig. 1, database 160), and a second algorithm operated on a

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computer system responsive to the tracking database both established and continuously updated exclusively using provided by the first set of camera, for dynamically adjusting the current view of each one or more cameras in a second set of movable cameras distinct from the first stationary camera (i.e. fig. 1, second stream of video images are the ones that are being transferred from video camera 101 and 102 to the system 120, col. 4, lines 8 – 10 and lines 35 – 45, col. 5, lines 37 – 53) , wherein each movable camera is automatically directed without user intervention to maintain an independent view of one or more participants and/or objects and outputs a second stream of video images (i.e. fig. 1, second stream of video images are the ones that are being transferred from video camera 101 and 102 to the system 120, col. 5, lines 37 – 53).

Sengupta teaches the use of stationary (non adjustable) video camera 103 for generating a video stream. But is silent in regards to using plurality (set) of stationary cameras for generating a video stream.

Jain in the same field teaches the use of a set of stationary camera for tracking the object and/or objects and generating a video stream by simultaneously image the scene (i.e. figs. 11a, 14 b, stationary video cameras 1 – 4).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to implement such teaching by using plurality of stationary video cameras for tracking the object and/or objects and generating a video stream by simultaneously image the scene and track the object.



Furthermore, Sengupta is silent in regards to explicitly mention where the second stream of video images is not used to determine any participant's or object's centroid X, Y coordinates or to otherwise update the tracking database.

Glatt in the same field teaches the use of slave/tracking cameras, using a control signal, representative of the location of the object/participant, generated by the pilot camera and processor for tracking the participant/object (col. 1, lines 58 – 67), which are not used to determine any participant's or object's X, Y coordinates or to otherwise update the tracking database.

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to implement such teaching by using slave/tracking cameras for tracking the object only and using a control signal, representative of the location of the object/participant, generated by the processor, as suggested by Glatt (col. 1, lines 58 – 67).

Regarding claims 98 and 112, a third algorithm operated on a computer system responsive to the tracking database and both the first and second streams of video images for determining the ongoing relative X, Y and Z coordinates of one or more specific, non-centroid location on each participant and for updating the tracking database to include the additional X, Y and Z coordinates of all detected locations (Sengupta; col. 4, lines 8 – 10, col. 5, lines 37 – 53).

Regarding claims 99 and 113, the limitation, wherein the contiguous view formed by the first set of stationary camera is substantially parallel to the ground surface within

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the predefined area (Sengupta, fig. 1, coplanar field of view of the non adjustable camera is substantially parallel to the ground, also Jain, fig. 11a).

Regarding claims 106 and 120, Sengupta teaches, wherein the second set of moveable cameras comprises at least two cameras and wherein the second set is additionally directed to automatically reassign any one or more cameras following any one or more objects to follow a different one or more objects based upon which camera view may currently be blocked by one object in front of another with respect to any camera view (i.e. cols. 4 – 5, lines 46 – 11).

11. Claims 100 – 105, 107 – 110, 114 – 119 and 121 – 124 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sengupta et al (US 6,359,647) in view of Jain et al (US 5,729,471) further in view of Glatt (US 6,724,421) and further in view of Leis (US 6,061,644).

Regarding claims 100 and 114, combination of Sengupta and Jain teaches, an automated system for tracking the movement of one or more objects within a predefined area based upon computer analysis, as discussed with respect to claim 97 above.

It is noted that, Sengupta is silent in regards to markers adhered onto one or more locations on each participant and/or object to be tracked that reflect, retroreflect or fluoresce energy, where the energy is detectable by the first and/or second set of cameras, and where the third algorithm now detects the adhered markers and updates the tracking database with related X, Y and Z coordinates of each detected marker for forming a three dimensional model of each participants activities.

Leis in the same field teaches, determining the position and orientation of one or more bodies (objects) by using markers (retro-reflective marker), which are affixed to one or more location on the object that reflect energy (i.e. fig. 1, col. 2, lines 61 – 67 and col. 3, lines 56 - 65).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the tracking system of Sengupta by placing markers on each objects that reflects non-visible energy/light as taught by Leis '644 for more sufficient accuracy of tracking multiple objects. Doing so would improve the accuracy of object position and orientation determination. Furthermore, third algorithm operated on the computer system responsive to the energy reflecting off the markers for updating the tracking database with related X and Y and Z coordinates of each marker (Leis, fig. 1, element 28, col. 4, lines 17 – 52, col. 6, lines 4 – 20 of Leis).

Regarding claims 101 and 115, the claimed, one or more energy sources emitting non-visible energy that is reflected or retro-reflected by the markers and is detected by the first and/or second set of cameras (Leis, fig. 1, 24L and 24R “energy sources emitting infrared energy”)

Regarding claims 102 – 105 and 116 – 119, the limitations claimed, at least one uniquely encoded marker adhered onto a top surface of each participant and/or object and a forth algorithm operated on the computer system, ..... are substantially similar to claims 100 - 101 and have the same result, therefore the grounds for rejecting claims 100 – 101 also applies here.

Regarding claim 107, the limitations claimed have been analyzed and rejected with respect to combination claims 97 and 102 above.

Regarding claim 108, the limitation, a second algorithm operated on a computer system responsive to the tracking database both established and continuously updated exclusively using provided by the first set of camera, for dynamically adjusting the current view of each one or more cameras in a second set of movable cameras distinct from the first stationary camera (Sengupta, fig. 1, second stream of video images are the ones that are being transferred from video camera 101 and 102 to the system 120, col. 4, lines 8 – 10 and lines 35 – 45, col. 5, lines 37 – 53).

Regarding claims 109 - 110, the limitations claimed have been analyzed and rejected with respect to claims 100 - 101 above.

Regarding claim 121, It is noted that, Sengupta is silent in regards to uniquely encoded marker adhered onto a top surface of each participant and/or object to be uniquely identified, prior to the predefined time, that reflect, retroreflect or fluoresce energy.

Leis in the same field teaches, determining the position and orientation of one or more bodies (objects) by using markers (retro-reflective marker), which are affixed to one or more location on the object that reflect energy (i.e. fig. 1, col. 2, lines 61 – 67 and col. 3, lines 56 - 65).

In view of the above, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the tracking system of Sengupta by placing markers on each objects that reflects non-visible energy/light as taught by

Leis '644 for more sufficient accuracy of tracking multiple objects. Doing so would improve the accuracy of object position and orientation determination. Furthermore, third algorithm operated on the computer system responsive to the energy reflecting off the markers for updating the tracking database with related X and Y and Z coordinates of each marker (Leis, fig. 1, element 28, col. 4, lines 17 – 52, col. 6, lines 4 – 20 of Leis).

Regarding claim 122, the limitation, dynamically adjusting the current view of each one or more cameras in a second set of movable cameras distinct from the first stationary camera (Sengupta, fig. 1, second stream of video images are the ones that are being transferred from video camera 101 and 102 to the system 120, col. 4, lines 8 – 10 and lines 35 – 45, col. 5, lines 37 – 53).

Regarding claims 123 - 124, the limitations claimed have been analyzed and rejected with respect to claims 100 - 101 above.

### Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Behrooz Senfi** whose telephone number is **(571) 272-7339**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mehrdad Dastouri** can be reached on **(571) 272-7418**.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231


**Or faxed to:**

**(571) 273-8300**

Hand-delivered responses should be brought to Randolph Building, 401 Dulany Street, Alexandria, Va. 22314.

Any inquiry of a general nature or relative to the status of the application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is **(571) 272-6000**.

B. M. S.

  
**TUNG VO**  
**PRIMARY EXAMINER**